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TERRITORY DENSITY OF CERULEAN WARBLER AT FROZEN HEAD STATE NATURAL AREA, TENNESSEE, 1994-2015

Scott G. Somershoe[1], Melinda J. Welton[2]

ABSTRACT

Cerulean Warbler (*Setophaga cerulea*) is one of the fastest declining songbirds breeding in North America. The Cumberland Mountains of Tennessee support approximately 17% of the global breeding population of Cerulean Warblers at the southern end of their breeding range. In 2009, a survey conducted from 1994–2000 was reestablished on a plot in Frozen Head State Natural Area, Morgan County, Tennessee, to assess long-term trends in density of this species. Cerulean Warbler breeding densities fluctuated annually but did not show significant changes at Frozen Head State Natural Area from 1994–2015, in contrast to long-term range-wide and regional population trends. We also documented a breeding density of 25.5 pairs per 24.7-acres (10-hectare) in 2013, which is among the highest known breeding densities of Cerulean Warblers. Current research suggests that the population of Cerulean Warblers in the Cumberland Mountains may be a stable population. Protecting large blocks of mountainous, mature, deciduous forest in this region may be beneficial to Cerulean Warblers and the suite of declining Neotropical–Nearctic migratory songbirds.

INTRODUCTION

Neotropical–Nearctic migratory songbirds are a group of rapidly declining birds and are of high conservation concern of those that breed in North America and winter in Central and/or South America (Rosenberg et al. 2016). The Cerulean Warbler (*Setophaga cerulea*) is among one of the fastest declining songbirds in North America and has received a significant amount of resources for research and conservation action from state and federal agencies after the species was petitioned for listing under the Endangered Species Act in 2000 (Hamel 2000, Hamel et al. 2004, U.S. Fish and Wildlife Service 2021, Buehler et al. 2013, Rosenberg, et al. 2016). The Cerulean Warbler has shown a significant long-term, range-wide decline of 1.9% per year (1966–2019) and a short-term, non-significant trend of 0.22% per year (2009-2019), with an overall population loss of approximately 61.7% from 1966–2019 (Sauer et al.

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2020). Population trends in the Appalachian Mountain Bird Conservation Region (BCR) are comparable with a decline of 2.0% per year (1966–2019) and stable non-significant short-term trend of 0.04% (2009–2019). Cerulean Warbler population trends in Tennessee, although inclusive of small populations outside the Appalachian Mountain BCR, are also quite similar with significant long-term, statewide declines of 2.2% per year (1966–2019) and a non-significant, stable short-term trend of 0.90% (2009–2019). Cerulean Warblers generally breed in large tracts of mature deciduous forests, most abundantly in higher elevations, especially along ridgetops in the mountains, with smaller numbers along river bottoms. Loss, degradation, and fragmentation of mature deciduous forest on the breeding and wintering grounds (Robbins et al. 1992, Hamel 2000, Wood et al. 2005, Wood et al. 2006, Buehler et al. 2013), and migration stopover habitat (Parker 1994, Welton et al. 2012, Bayly and Welton 2014) is generally considered the main cause of this decline.

The Appalachian Mountains support approximately 80% percent of the global breeding population of Cerulean Warblers (Wood et al. 2013). The highest breeding density of this species has been recorded within the 146,000 acre (59,000 hectare) North Cumberland Wildlife Management Area (NCWMA) and the adjacent 24,000 acre (9,712 hectare) Frozen Head State Natural Area (FHSNA) in Tennessee (Nicholson 2004, Buehler et al. 2008, Boves 2011). The state of Tennessee has management control of the NCWMA and FHSNA and is the single largest landholder of Cerulean Warbler breeding habitat of this species, with possibly >20% of the global population breeding on these public lands (Buehler et al. 2006).

In spring 2009, Cerulean Warbler breeding density monitoring was re-established on a 24.7-acre (10-hectare) study site at FHSNA that had been surveyed annually from 1994-2000. Our objective was to assess long-term breeding density trends on a passively managed site in a core Cerulean Warbler breeding population. These efforts have been undertaken as part of a larger project focused on the ecology of Cerulean Warblers in the Cumberland Mountains of Tennessee (Nicholson 2004).

METHODS

Census technique: We used spot-mapping protocols (Bibby et al. 2000) and general field methods as used by Nicholson (2004) for consistency in data collection and comparable data across survey efforts. Breeding territories were mapped during eight visits, with at least one day and an average of four days between visits, over a six-week period from mid-May through mid-June in 2009, 2011, 2013, and 2015. During each visit, a single observer surveyed the entire plot with the starting point and route through the plot varying with each visit. Surveys were initiated at sunrise and completed within four hours. Welton conducted 30 of 32 surveys in the study, while the other two surveys were conducted by Somershoe, both in 2009. Transects were walked, alternating direction between visits, within the study plot recording the singing locations and noting behaviors of male songbirds detected on the plot. Counter-singing male songbirds were closely noted as these encounters helped identify territorial boundaries. Spot map visits were combined at the end of the season.

The number of territories of songbirds was then determined from the clusters of observations based on Bibby et al. (2000). We defined a full territory where at least three detections were recorded within the study plot with two encounters at least 10 days apart. For territories overlapping the edge of the study plot, a 0.75 territory was defined as three detections recorded with at least two occurring inside the plot and 10 days apart; a 0.5 territory if three detections were recorded with at least two occurring inside the plot and at least seven days apart; and as a 0.25 territory if two detections were

recorded inside the plot at least seven days apart. Our method of defining territories is comparable to other studies, but with more specificity and slightly more conservative than Bibby et al. (2000), Nicholson (2004), Boves (2011), and Newell et al. (2013). Thus, our densities are likely lower than what could be calculated using Bibby et al. (2000) alone.

RESULTS

Densities of Cerulean Warbler territories fluctuated between the years but showed no significant change from 1994 through 2015 (regression, $P>0.05$, $R^2=0.17$) (Figure 1). Annual variation in Cerulean Warbler breeding density was large (range 15.25-25.5 territories per 24.7-acres [10-hectare]) with an average of 20.2 territories per 24.7-acre (10-hectare) over the four years of the study (Table 1). Nicholson (2004) recorded lower breeding densities that were not significantly different on this study plot with densities ranging from 8.7 to

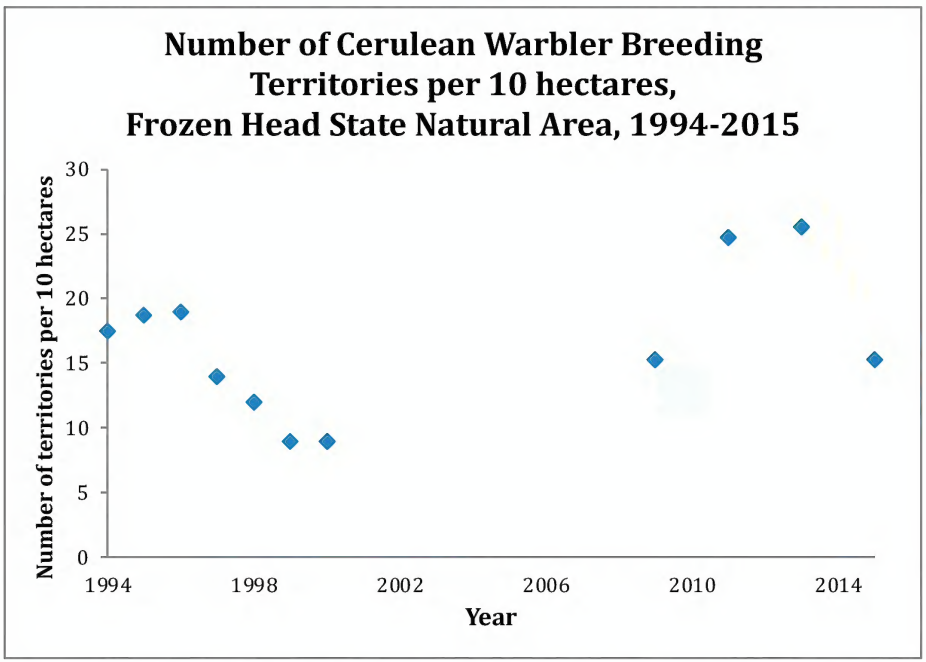

Figure 1. Breeding bird density (pairs/ha) for all Cerulean Warblers recorded on Frozen Head State Natural Area, Morgan County, Tennessee, 1994–2015.

Common name	Scientific name	Density (pairs/10-hectares)										
		1994	1995	1996	1997	1998	1999	2000	2009	2011	2013	2015
Cerulean Warbler	*Setophaga cerulea*	18	19	19	14	12	9	9	15.3	24.8	25.5	15.3

Table 1. Cerulean Warbler breeding bird density (pairs/10-hectares) on Frozen Head State Natural Area, Morgan County, Tennessee, 2000-2015.

18.3 territories per 24.7-acres (10 hectares) between 1994 and 2000 with an average of 14.1 territories per 24.7-acres (10 hectares).

DISCUSSION

While Cerulean Warbler populations continue to experience declines in some regions of their breeding range, the densities on our study plot have remained largely unchanged since 1994. Whether this is the result of maintained preferred forest structure on the site and in the surrounding landscape, high nest success and return rates of adults and juveniles, emigration from other breeding areas (Greenwood and Harvey 1982), or other factors, is unknown. Minor differences in how we calculated a partial or full territory compared to Nicholson (2004) could explain small differences in annual territory density; however our methodology is slightly more conservative than Bibby et al. (2000) and others, and Cerulean Warbler densities did not change significantly across the 21 years of surveys on this plot. Perhaps the steep slopes of FHSNA, a wildfire in 1952, and natural disturbances, i.e. tree fall gaps, have produced and maintained the forest structure conditions preferred by Cerulean Warblers (Boves 2011), thus resulting in variable, but consistently high breeding densities.

The population trend for Cerulean Warblers across the Cumberland Mountains of Tennessee has been generally stable (Nicholson 2004, Buehler et al. 2006, Buehler et al. 2008, Boves 2011, Raybuck 2022). However, modest declines were observed in annual surveys of the Bird Mountain Trail and North Old Mac Trail area of FHSNA from 1993–2008 (S. Stedman, pers. comm.). Despite generally stable breeding populations at FHSNA and NCWMA, many smaller, isolated populations across Tennessee and the Appalachian Mountain region have declined or disappeared over the last 20–30 years (MJW, pers. observ.). However, small numbers of breeding birds persist in the Mississippi Alluvial Valley and at a small number of locations in middle Tennessee (MJW, pers. comm., SGS, pers. observ., SJS, pers. comm.).

Boves (2011) compared Cerulean Warbler territory density in four mature forest plots in West Virginia, Kentucky and two areas of the NCWMA in Tennessee. Three of the four plots in each area were manipulated under different standard forestry practices to emulate the range of potential forest disturbance regimes likely in mature forest (i.e., light, intermediate, and heavy harvest treatment), with one serving as a control. The light treatment reduced basal area (BA) and canopy cover (CC) by approximately 20%, the intermediate treatment reduced BA and CC by 40%, and the heavy treatment reduced BA and CC by 75%. The majority of high Cerulean Warbler densities, 17.0+ territories per 24.7-acre (10-hectare), were in pre-treatment and control stands on the adjacent NCWMA. Densities generally increased post-disturbance with densities of 20.5 territories per 24.7-acre (10-hectare) or lower, with one exception of 23 territories per 24.7-acre (10-hectare) on a site 4 years post-harvest in West Virginia in 2010, comparable to the higher densities recorded on our study site on FHSNA (TJB, pers. comm.). The highest breeding densities of Cerulean Warbler ever recorded, including 25.5 territories per 24.7-acre (10-hectare) from this study, have been in mature (80-120+ year old), passively managed hardwood forests above 2,099-feet (640-meters) in the NCWMA (Nicholson 2004, Buehler et al. 2006, Buehler et al. 2008, Boves 2011). The highest territory density in our study (25.5 territories per 24.7-acre [10-hectare]) results in an average territory size of 0.96-acre (0.39-hectare), which is comparable to densities recorded in other studies and locations, i.e., 0.91 ± 0.07 acre (0.37-hectare) (Perkins 2006) and 1.06-acre (0.43-hectare) at NCWMA (Boves 2011); however in other parts of their range territory size tends to be notably larger, i.e., 2.4 ± 0.18

acre (0.96-hectare) in Ontario (Barg et al. 2006) and 2.2±0.1 acre (0.9-hectare) in Missouri (Robbins et al. 2009).

Cerulean Warblers show generally low rates of site fidelity in the Cumberland Mountains (Boves 2011, Raybuck 2022). Despite low site fidelity, nest success data in the Cumberland Mountains in Tennessee suggest high density areas may also have the highest global reproductive rates and potentially represent one of the few source populations for Cerulean Warblers (Boves 2011, DAB, pers. comm). However, Girvan et al. (2007) have suggested that up to 28% of adult male Cerulean Warblers participate in long-distance dispersal between breeding seasons, possibly as a result of failed nesting attempts. Girvan et al. (2007) also suggested that local population abundance may not be a good indicator of population health or habitat quality. Thus additional research is needed to assess return rates, origin of breeding birds, productivity and survival of adults and fledglings, and dispersal of Cerulean Warblers in order to quantify habitat quality for Cerulean Warblers and determine whether the Cumberland Mountains in Tennessee may be a source or a sink population by attracting birds from higher quality nesting sites and/or declining populations.

Current information suggests that the Cumberland Mountains are likely a source population for Cerulean Warblers in most years. Until data is available to support or modify the current supposition, we encourage management of the forests to maintain forest structure that continues to support these high densities of breeding Cerulean Warblers. As isolated populations of Cerulean Warblers continue to decline or disappear, conservation of the high elevation mature forests in the Cumberland Mountains of Tennessee may have the potential to become even more critical to the long-term persistence of the species.

ACKNOWLEDGMENT

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ROUND TABLE NOTE

RED-SHOULDERED HAWK PHOTOGRAPHED EATING EARTHWORMS — On 22 December 2022, a Red-shouldered Hawk (*Buteo lineatus*) was observed on the ground in a grassy field behind an unoccupied house near the intersection of Appling Road and Southern Way in Bartlett, Shelby County, Tennessee (across from Appling Lake). As I approached the hawk to photograph it, I noticed the hawk would occasionally hop up and down a few times as if it were after a prey item. At no time could I see what it was after. However, upon examination and processing (cropping, brightness correction, small amount of noise reduction/sharpening) of the images, I discovered that the hawk had a worm (species unknown) in its beak and was, in fact, eating worms. It appears the hopping behavior was the hawk's attempt at capturing the worms.

This is not the first time a Red-shouldered Hawk had been observed on the ground in this area. About two weeks prior to taking pictures on 22 December, my wife, Debra Kienzle, and I saw a Red-shouldered Hawk on the ground in the same yard two consecutive days. On both days, the hawk was only 5 meters from Southern Way. At that time we did not observe it hopping or eating, but instead assumed it was consuming prey it had already captured. With the observation made on 22 December, however, it is possible that it was hunting for and consuming earthworms and may do so regularly in this area.

Thomas Kienzle, Bartlett, Tennessee

Figure 1. Red-shouldered Hawk (*Buteo lineatus*) was observed on the ground in a grassy field eating an earthworm. Photo by Thomas Kienzle.

REPORT OF THE TENNESSEE BIRD RECORDS COMMITTEE, 2022

Graham Gerdeman
Nashville, Tennessee

It is the job of the Tennessee Bird Records Committee (TBRC) to maintain the Official List of the Birds of Tennessee and to ensure that sightings of rare species are documented accurately and adequately for posterity. This list, along with the by-laws of the committee and information for submitting documentation, may be viewed in the TBRC section of the TOS website (https://tnbirds.org/tennessee-bird-records-committee/). Current members of the committee are Graham Gerdeman (Secretary), Ron Hoff, Chris Sloan, Beth Schilling, Mark Greene, Michael Smith, and Jeff Walck (alternate). We wish to thank all who have taken the time to document and submit rare bird records.

Many of these reports are accompanied by photographic documentation, which is especially valuable to the work of the committee. If a recently submitted record is not included in this list, it is probably still under review. If an older submitted record is not included, please send an email to tbrc@tnbirds.org. Please note, a species is considered provisional if it is not verified by an extant specimen, extant photograph or sound recording, or the written documentation of three independent observers of a species or of the same individual bird.

White-winged Dove (*Zenaida asiatica*)

Written documentation and photographs of a single individual attending a feeder for many months, from 2 March - 4 Sept, 2022 ; Lewisburg, Marshall County. Accepted 6-0.

Black-headed Grosbeak (*Pheucticus melanocephalus*)

Written documentation and photographs of a single individual submitted by Mary Miller; Red Bank, Hamilton County, 10 April 2022. Accepted 6-0.

Western Kingbird (*Tyrannus verticalis*)

Written documentation and photographs of one individual submitted by Jim Arnett. Timberland Park, Williamson County, 11 May 2022. This is a rare Spring record and an apparent first county record (6th record from Greater Nashville Area). Accepted 6-0.

Black-bellied Whistling-Duck (*Dendrocygna autumnalis*)

Written documentation and photographs of one individual submitted by Chris Carlough; Rising Glory Farm, Lewisburg, Marshall County, 5 May 2022. This is an apparent first county record. Accepted 6-0.

Arctic Tern (*Sterna paradisaea*)

Written documentation and photographs of a single bird submitted by Alan Troyer; mouth of the Duck River, New Johnsonville, Humphreys County, 28 May 2022. This represents a fifth state record (second photographed record), and a first county record. Accepted 6-0.

Allen's Hummingbird (*Selasphorus sasin*) - 2 records

Written documentation and photographs a single adult male bird coming to a backyard

feeder which was caught and banded by Cyndi Routledge, submitted by Linda Fields; Buchanan, Henry County, 23 August 2022. Initial submission was rejected 4-2 for lack of documentation. Resubmission accepted 6-0. This represents a first county record and 12th state record.

Written documentation and photographs of an apparent juvenile female bird which was caught and banded by Sandy Bivens, Davidson County, 23 November 2022. Though documentation was thorough, the record was rejected 4-2 due to lack of complete certainty to rule out Rufous Hummingbird.

Black-throated Gray Warbler (*Setophaga nigrescens*)

Written documentation and photographs of one individual submitted by Kellie Sharpe; Greene County, 30 October 2022, continuing for approximately one week and seen by multiple observers. This is the first living state record and a first county record. Accepted 6-0.

Ferruginous Hawk (*Buteo regalia*)

Written documentation and photographs of individual submitted by Mark Greene; southwest of Trenton, Gibson County, 9 November 2022. A long-staying bird, last reported on 27 January 2023. This is a first county record. Accepted 6-0.

Lark Bunting (*Calamospiza melanocorys*)

Written documentation and photographs of individual found by David Makers (submitted by Graham Gerdeman); Liberty Park, Clarksville, Montgomery County, 13 November 2022 and last reliably reported on 28 November. This represents a third state record and first county record. Accepted 6-0.

Townsend's Solitaire (*Myadestes townsend*)

Written documentation and photographs of bird submitted by Alan Troyer; Linden, Perry County, 19 December 2022. This is a seventh state record and first county record. Accepted 6-0.

2022 TENNESSEE FALL BIRD COUNTS

Ron Hoff
Loudon, Tennessee

There were five Fall Bird Counts conducted this year. One hundred eighty observers in 74 parties compiled 376.27 party hours in the field to tally 39,094 individual birds, which represented 180 species.

The weather was reasonably mild during the count period with few rain events, and only Knox County experienced any high winds, gusting to 25 mph. Temperatures ranged from 50° F in Elizabethton to 85° F in Nashville.

Eared Grebe in Knoxville was a new species. Notable highlights included American Black Duck, Virginia Rail, American Golden-Plover, Baird's Sandpiper, Short-billed Dowitcher, Laughing Gull, Red Crossbill, Lark Sparrow, Henslow's Sparrow, and Connecticut Warbler.

Record high numbers were recorded for the following: Chimney Swift, and Fish Crow. Record low or very low numbers were recorded for the following: Forster's Tern, Black-crowned Night-Heron, Turkey Vulture, Sharp-shinned Hawk, Red-tailed Hawk, Barred Owl, American Crow, Northern Mockingbird, Veery, Gray-cheeked Thrush, Dark-eyed Junco, Song Sparrow, Swamp Sparrow, Baltimore Oriole, Common Yellowthroat, Indigo Bunting.

Counts are placed in the table geographically from West to East. Taxonomy follows the latest revision of the AOS Checklist of North American Birds.

COUNT SUMMARIES

(F/Y = feeder/yard watcher)

Blount County (BLNT) – 17 September; 0405-2200. Weather: partly cloudy; wind WNW 1.25 mph; 62-82° F. Count highlights included Barn Owl, 3 Olive-sided Flycatchers, Common Raven, and Henslow's Sparrow. Observers: Jean J. Alexander, Kathryn Barrow, Rick Barrow, Christie Bass, Andrea Bratcher, Warren Bielenberg, Doug Bruce, Stephanie Crain, Wanda DeWaard, Melinda Fawver, Andy Feldt, Marian D. Fitzgerald, Tom E. Fitzgerald, Sandy Graves, Paul Hartigan, Kim Henry, Stephen P. Henry, Thomas D. Howe (compiler), Susan Hoyle, Bob Howdeshell, James R. Human, David M. Johnson, Kris Johnson, Evan Kidd, Jason Kyhm, Julie Labhart, Logan Rosenberg, Michael G. Ryon, Mary Tankersley, Harumi Tsuruoka, Jimmy Tucker, June D. Welch, Valerie Wininger, and Randy C. Winstead.

Elizabethton (ELIZ) – 24 September; 0445-2000. Weather: cloudy, light rain AM; wind NW 0-10 mph; 50-67° F. Notable sightings included American Black Duck, Merlin, Peregrine Falcon, Marsh Wren, and Red Crossbill. Observers: Wes Anderson, Rob Armistead, Jerry Bevins, Rob Biller, Tammie Bright, Debi Campbell, J. G. Campbell, Ron Carrico, Harry Lee Farthing, Dave Gardner, Connie Irick, David Irick, Jackie Knight, Rick Knight (compiler), Roy Knispel, Richard Lewis, Vern Maddux, Joe McGuiness, Brookie Potter, Jean Potter, Judith Reid, Judi Sawyer, Bryan Stevens, Kim Stroud, Scott Turner, and Charles Warden.

Knoxville (KNOX) – 25 September; 0630-1949. Weather: cloudy; wind SW 0-10 mph, gusts to 25; 63-79° F. Green-winged Teal, Eared Grebe, Laughing Gull, and Forster's Tern

were new species. Other highlights included Broad-winged Hawk and Connecticut Warbler. Observers: Amy Abercrombie, Robert Abercrombie, Zack Arnold, Karen Beuerlein, Eric Bodker, Jake Buller-Young, Robert Champlin, Jason Cole, Howard Cox, James Davis, Tara Davis, Kerri Dikun, Jeremy Dotson, K. Dean Edwards (compiler), Chuck Estes, Kelly Fox, Dallas Harrell, Paul Hartigan, Ron Hoff, Angela Hoffman, Nathaniel Hoffman-McConchie, Susan Hoyle, James Human, Kristine Johnson, Bill Keeler, Evan Kidd, Luke Lewis, Rita Lewis, Pasquel Lozengue, Jennifer Manges, Bruce Marshall, Seth McConchie, Jessica Moore, Dollyann Myers, Jilynn Parmly, Joe Pyle, Patrick Rakes, W. Kelly Roy, Martha Rudolph, Michael Ryon, Beth Schilling, Ron Shrieves, Taylor Schultz, Cara Simpson, Colin Sumrall, Robert Terrell, Keith Watson, Chris Welsh, Jacob Wessels, Shane Williams, and Valerie Wininger.

Nashville (NASH) – 24 September; 0530-1845. Weather: rainy early, sunny; light breezes; 52-85° F. Notable sightings included American White Pelican, Lesser Black-backed Gull, Olive-sided Flycatcher, Fish Crow, Veery, Connecticut Warbler, and Vesper Sparrow. Observers: Jona Adomakoh, Valerie Adomakoh, Aparna Arcot, Kim Bailey, Michela Biale, Ashley Briggs, Susan Bradfield, Trae Bradfield, Lise Brown, Jean Buchanan, Phillip Casteel, Richard Connors, Laura Cook, Allyson Davenport, Cassy Dorff, Jessica Dragonetti, Ariel Dunham, Frank Fekel, Avery Fish, Kelli Fly, Todd Foster, Steve Goodbred, Mark Hackney, Joe Hall, Barbara Harris (compiler), Randy Harrod, Devin Hollister, Melissa James, Chet Jameson, John Kell, Tim Loyd, Denis Lovell, Joe McLaughlin, Paige O'Neal, Amy Pardo, Hannah Pardo, Jordan Rex, Sarah Scott, Jan K. Shaw, Shelia Shay, Chris Sloan, Michael Smith, Nathan Snell, Ruben Stoll, Mary Glynn Williamson, Grant Winter, Larry Yocum, and Paul Yoder.

Shelby County (SHLB)– 10 September; 0615-1815. Weather: partly cloudy; wind NW-E 4-10 mph; 68-80° F. Sixteen species of shorebirds and Lark Sparrow were notable. Observers: Judith Barrie, Betty Blaylock, Chad Brown, Sue Cosmini, Gregg Elliot, Bob Foehring, Deb Foehring, Margaret Jefferson, Sarita Joshi, Perry Larimer, Dick Preston (compiler), Ryan Pudwell, Mary Schmidt, Caroline Schratz-Lovett, Norman Soskel, Cathy Souther, Ed Thomas, Cliff VanNostrand, Jim Varner, Tricia Vesely, Anita Vincent, and Martha Waldron.

2022 Fall Bird Counts Count date Species	**SHLB** 10-Sep	**NASH** 24-Sep	**BLNT** 17-Sep	**KNOX** 25-Sep	**ELIZ** 24-Sep	**Totals**
Black-bellied Whistling-Duck	41	-	-	-	-	41
Canada Goose	161	276	224	728	881	2270
Wood Duck	97	20	23	26	50	216
Blue-winged Teal	34	5	6	33	3	81
Northern Shoveler	2	-	-	-	-	2
Mallard	36	131	32	158	195	552
American Black Duck	-	-	-	-	1	1
Green-winged Teal	-	2	-	1	-	3
Common Merganser	-	-	-	-	6	6
Northern Bobwhite	-	1	16	1	6	24
Wild Turkey	9	100	29	4	50	192
Pied-billed Grebe	1	7	2	3	1	14
Eared Grebe	-	-	-	1	-	1
Rock Pigeon	108	144	160	170	477	1059
Eurasian Collared-Dove	2	6	1	-	8	17
Mourning Dove	388	100	248	151	248	1135
Yellow-billed Cuckoo	5	5	3	1	3	17
Common Nighthawk	1	2	11	1	1	16
Chimney Swift	1868	346	167	203	91	2675
Ruby-throated Hummingbird	59	15	72	23	18	187
Virginia Rail	-	-	-	-	2	2
Sora	-	-	-	-	1	1
American Coot	-	6	-	-	-	6
Black-necked Stilt	4	-	-	-	-	4
American Golden-Plover	1	-	-	-	-	1
Killdeer	188	49	28	53	12	330
Semipalmated Plover	4	-	-	-	-	4
Stilt Sandpiper	2	-	-	-	-	2
Sanderling	1	-	-	-	-	1
Baird's Sandpiper	2	-	-	-	-	2
Least Sandpiper	2600	-	-	-	-	2600
Pectoral Sandpiper	105	-	-	-	-	105
Semipalmated Sandpiper	29	-	-	-	1	30
Western Sandpiper	3	-	-	-	-	3
Short-billed Dowitcher	1	-	-	-	-	1
Wilson's Snipe	-	-	1	-	1	2
Spotted Sandpiper	2	1	1	-		4
Solitary Sandpiper	4	-	-	-	-	4
Lesser Yellowlegs	55	-	-	-	-	55
Greater Yellowlegs	3	-	-	-	-	3
Laughing Gull	-	-	-	1	-	1
Ring-billed Gull	-	4	-	-	-	4
Lesser Black-backed Gull	-	1	-	-	-	1
Forster's Tern	-	-	-	1	-	1
Double-crested Cormorant	8	392	23	61	30	514

2022 Fall Bird Counts Count date Species	SHLB 10-Sep	NASH 24-Sep	BLNT 17-Sep	KNOX 25-Sep	ELIZ 24-Sep	Totals
American White Pelican	-	1	-	-	-	1
Great Blue Heron	30	29	17	22	25	123
Great Egret	63	52	5	2	5	127
Little Blue Heron	8	-	-	-	-	8
Cattle Egret	1	-	-	-	-	1
Green Heron	7	3	7	1	4	22
Black-crowned Night-Heron	-	-	1	-	-	1
Yellow-crowned Night-Heron	1	-	1	-	-	2
Black Vulture	7	285	28	67	43	430
Turkey Vulture	26	84	40	38	82	270
Osprey	-	6	2	8	8	24
Northern Harrier	-	-	-	-	1	1
Sharp-shinned Hawk	-	-	-	-	1	1
Cooper's Hawk	8	10	6	5	5	34
Bald Eagle	1	2	-	6	4	13
Mississippi Kite	3	-	-	-	-	3
Red-shouldered Hawk	13	5	10	13	7	48
Broad-winged Hawk	-	1	1	1	-	3
Red-tailed Hawk	9	24	10	15	9	67
Barn Owl	1	-	1	-	-	2
Eastern Screech Owl	1	7	1	5	19	33
Great Horned Owl	2	4	9	1	7	23
Barred Owl	1	5	1	1	4	12
Belted Kingfisher	8	17	15	18	25	83
Red-headed Woodpecker	10	6	5	-	8	29
Red-bellied Woodpecker	58	105	69	82	69	383
Yellow-bellied Sapsucker	-	1	3	-	2	6
Downy Woodpecker	33	98	59	61	32	283
Hairy Woodpecker	1	11	6	7	24	49
Northern Flicker	5	49	18	27	50	149
Pileated Woodpecker	18	38	21	12	29	118
American Kestrel	9	10	1	6	24	50
Merlin	-	-	1	-	1	2
Peregrine Falcon	-	-	-	-	2	2
Great Crested Flycatcher	5	-	-	-	1	6
Eastern Kingbird	4	6	-	3	-	13
Olive-sided Flycatcher	-	1	3	-	-	4
Eastern Wood-Pewee	42	50	47	27	12	178
Acadian Flycatcher	25	3	2	2	1	33
Alder Flycatcher	-	1	-	-	-	1
"Traill's" Flycatcher	1	-	-	-	-	1
Least Flycatcher	2	1	1	2	-	6
Empidonax sp.	2	-	1	2	1	6
Eastern Phoebe	11	25	44	48	93	221
White-eyed Vireo	67	50	40	20	4	181

2022 Fall Bird Counts Count date Species	**SHLB** 10-Sep	**NASH** 24-Sep	**BLNT** 17-Sep	**KNOX** 25-Sep	**ELIZ** 24-Sep	**Totals**
Yellow-throated Vireo	15	6	3	7	3	34
Blue-headed Vireo	-	1	2	1	15	19
Philadelphia Vireo	1	2	-	5	-	8
Warbling Vireo	1	1	1	2	-	5
Red-eyed Vireo	37	11	7	13	11	79
Blue Jay	66	296	231	237	415	1245
American Crow	88	152	174	230	436	1080
Fish Crow	2	4	15	6	2	29
Common Raven	-	-	1	-	11	12
Carolina Chickadee	58	266	216	199	167	906
Tufted Titmouse	72	191	134	138	136	671
Tree Swallow	-	8	12	90	130	240
Northern Rough-winged Swallow	18	12	-	29	-	59
Purple Martin	-	2	-	-	-	2
Barn Swallow	17	5	1	4	6	33
Ruby-crowned Kinglet	-	7	-	3	3	13
Golden-crowned Kinglet	-	-	-	-	4	4
Cedar Waxwing	-	254	57	68	225	604
Red-breasted Nuthatch	-	6	3	6	7	22
White-breasted Nuthatch	23	79	49	49	51	251
Brown-headed Nuthatch	-	-	8	10	-	18
Blue-gray Gnatcatcher	10	18	7	2	1	38
Carolina Wren	39	183	180	165	157	724
House Wren	-	4	5	10	9	28
Winter Wren	-	-	-	-	1	1
Marsh Wren	-	-	-	-	1	1
Gray Catbird	4	44	59	57	37	201
Brown Thrasher	10	31	34	29	9	113
Northern Mockingbird	34	73	118	146	69	440
European Starling	2905	627	337	763	453	5085
Eastern Bluebird	18	177	139	139	169	642
Veery	-	1	-	-	2	3
Gray-cheeked Thrush	-	3	-	10	5	18
Swainson's Thrush	1	22	20	37	85	165
Wood Thrush	1	4	1	4	28	38
American Robin	75	298	173	258	271	1075
House Sparrow	41	20	36	8	28	133
House Finch	53	184	93	86	52	468
Red Crossbill	-	-	-	-	2	2
American Goldfinch	14	91	119	42	145	411
Lark Sparrow	1	-	-	-	-	1
Chipping Sparrow	19	24	12	11	72	138
Field Sparrow	9	47	44	22	19	141
Dark-eyed Junco	-	-	2	-	17	19
White-throated Sparrow	-	1	-	-	-	1

2022 Fall Bird Counts Count date Species	**SHLB** 10-Sep	**NASH** 24-Sep	**BLNT** 17-Sep	**KNOX** 25-Sep	**ELIZ** 24-Sep	**Totals**
Vesper Sparrow	-	1	-	-	-	1
Henslow's Sparrow	-	-	1	-	-	1
Song Sparrow	1	6	34	37	83	161
Eastern Towhee	16	45	26	40	59	186
Yellow-breasted Chat	-	1	1	-	-	2
Bobolink	-	-	-	40	-	40
Eastern Meadowlark	9	28	13	22	17	89
Red-winged Blackbird	500	30	83	93	67	773
Brown-headed Cowbird	190	57	33	10	-	290
Common Grackle	300	30	700	79	-	1109
Blackbird sp.	3000	-	-	-	-	3000
Ovenbird	-	1	1	8	4	14
Worm-eating Warbler	-	-	-	-	1	1
Northern Waterthrush	-	-	3	4	2	9
Golden-winged Warbler	1	-	-	2	-	3
Blue-winged Warbler	1	1	1	1	-	4
Black-and-white Warbler	1	26	4	21	13	65
Prothonotary Warbler	2	-	-	-	-	2
Tennessee Warbler	5	29	26	97	57	214
Orange-crowned Warbler	-	2	1	2	1	6
Nashville Warbler	-	1	-	10	3	14
Connecticut Warbler	-	1	-	1	-	2
Kentucky Warbler	-	2	-	-	-	2
Common Yellowthroat	8	26	10	22	15	81
Hooded Warbler	8	-	8	15	4	35
American Redstart	-	89	17	57	34	197
Cape May Warbler	-	1	14	17	18	50
Northern Parula	16	11	5	13	10	55
Magnolia Warbler	8	102	16	76	25	227
Bay-breasted Warbler	-	15	1	28	16	60
Blackburnian Warbler	-	6	-	8	11	25
Yellow Warbler	2	1	1	-	-	4
Chestnut-sided Warbler	1	8	4	16	5	34
Black-throated Blue Warbler	-	-	-	-	15	15
Palm Warbler	-	5	32	63	96	196
Pine Warbler	5	11	10	12	6	44
Yellow-rumped Warbler	-	6	4	4	5	19
Yellow-throated Warbler	3	8	2	1	1	15
Prairie Warbler	-	-	1	-	2	3
Black-throated Green Warbler	3	28	4	18	17	70
Canada Warbler	-	2	-	-	1	3
Warbler sp.	-	-	4	-	-	4
Summer Tanager	38	44	3	10	1	96
Scarlet Tanager	1	4	5	8	14	32
Northern Cardinal	106	336	179	235	165	1021

2022 Fall Bird Counts Count date Species	**SHLB** 10-Sep	**NASH** 24-Sep	**BLNT** 17-Sep	**KNOX** 25-Sep	**ELIZ** 24-Sep	**Totals**
Rose-breasted Grosbeak	1	48	2	11	65	127
Blue Grosbeak	26	2	5	3	2	38
Indigo Bunting	66	76	14	26	5	187
Dickcissel	5	-	-	-	-	5
Total individuals	14262	6848	5084	6118	6782	39094
Total species	118	127	118	117	125	180
Observers	22	48	23	51	36	180
Parties	10	9	15	31	9	74
Party hours	38.25	75.75	100.25	81.02	81	376.27
Hours by car	10	11.92	16	6.46	-	44.38
Hours by foot	28.25	63.83	84.25	71.78	-	248.11
Hours by boat or other	-	-	-	2.78	-	2.78
Miles by car	27	162	177.5	93.9	-	460.4
Miles by foot	25.75	57.94	45.08	56.38	-	185.15
Miles by canoe or other	-	-	-	8.05	-	8.05
Hours owling	2.5	1	5.2	0.58	6	15.28
Miles owling	2	3	0.63	8	-	13.63
Feeder/yard watch observers	-	-	7	-	-	7
Feeder/yard watch hours	-	-	7.5	12.07	-	19.57

MINUTES OF THE FALL TOS BOARD OF DIRECTORS MEETING 1 October 2022

The annual Fall Board of Directors Meeting was held 1 October 2022 in Kingsport, Tennessee and hosted by the Kingsport Chapter. President Michael Collins called the meeting to order at 2:35 pm, and Secretary Cyndi Routledge determined there was a quorum. Minutes of the Spring Meeting were presented and approved as corrected.

OFFICERS REPORTS

TREASURER: Pam Lasley reported that TOS remains in excellent shape financially, although the downturn in the Stock Market has had some effect. The number of members as of September has increased roughly 4% (710 to 735) over 2021, but membership income is below our record-breaking last year when we had a high number of life memberships.

Investments – While our dividends are running slightly higher than this time last year, our market value has declined dramatically. Our value on 22 September 2022 was $379,745, down from $472, 039 at the beginning of the year. We withdrew $15,000 from our Money Market account this year, and the decrease in value was roughly $77,000. Our 10- and 5-year rates of return are still a positive 7.8% and 7% respectively, however our rate of return is a negative 11.2%.

We completed our final $5000 commitment to the Swan Conservation Trust for habitat conservation and paid $2000 to match funding from the Tennessee Wildlife Resources Agency for the publication of the *Discover Birds* workbooks.

The Migrant continues to be published in a timely manner, and we will have 4 editions produced by the end of the year.

The Tennessee Warbler had its last hard copy edition printed in the spring. By moving to electronic copies only the society will save approximately $3000 per year.

***THE MIGRANT*:** Editor Bob Ford reported we are still in need of a new editor for The Season report and for the Regions that are vacant. There may be a delay in publication of the next issue as he works to solve this matter.

COMMITTEE REPORTS

CONSERVATION RESEARCH FUNDING: Chair Michael Collins reported TOS awarded $8900 in grants this year, up from $3322 in 2021.

TOS WEBSITE: Cyndi Routledge reported for Webmaster Amy Wilms that work continues on templates for chapter webpages that will be integrated into the TOS main site. Also, a page is being developed to incorporate new issues of *The Migrant* as SORA is no longer accepting them.

NEW BUSINESS

Susan Hubley made the motion that we provide funding for local chapters that host state meetings. Up to $2500 will be available for hosting the annual Spring Meeting and $500 for

the Fall Meeting. The motion was adopted.

Pam Lasley made the motion that we authorize Ron Hoff to have additional field cards printed for distribution to the membership. The motion was adopted.

The meeting was adjourned at 3:58.

Respectfully submitted,
Cyndi Routledge, Secretary

THE SEASON – EDITOR'S NOTE

The Season report for summer birds (1 June to 31 July) is scheduled to be published in the December issue of The Migrant each year. This year the report will be delayed until a later issue; we are in the process of streamlining the report to make the information provided easier for volunteers to collect and compile for publication.

Bob Ford, Editor

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